查询N74F2245D供应商

DATA SHEET

74F2245

Octal transceiver with 30Ω equivalent output termination (3-State)

Product specification

IC15 Data Handbook

1996 May 10

Philips Semiconductors

PHILIPS

Octal transceiver with 30Ω equivalent output termination (3-State)

74F2245

FEATURES

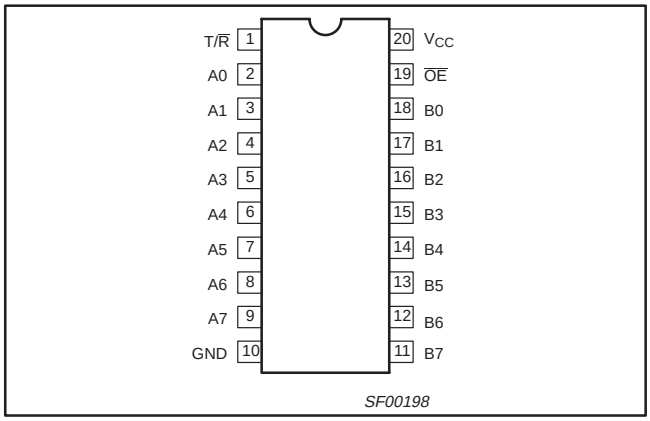
- Octal bidirectional bus interface
- 30 Ohm output termination for driving DRAM
- Outputs are placed in high impedance state during power-off conditions
- SSOP Type II package

DESCRIPTION

The 74F2245 is an octal transceiver featuring non-inverting 3-State bus compatible outputs in both transmit and receive directions. The device features an Output Enable ($\overline{OE}$) input for easy cascading and Transmit/Receive (T/$\overline{R}$) input for direction control. The 3-State outputs, B0-B7, have been designed to prevent output bus loading if the power is removed from the device.

The 30 Ohm series termination on the outputs reduces over/undershoot making them ideal for driving DRAM.

PIN CONFIGURATION



TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F2245	4.0ns	70mA

ORDERING INFORMATION

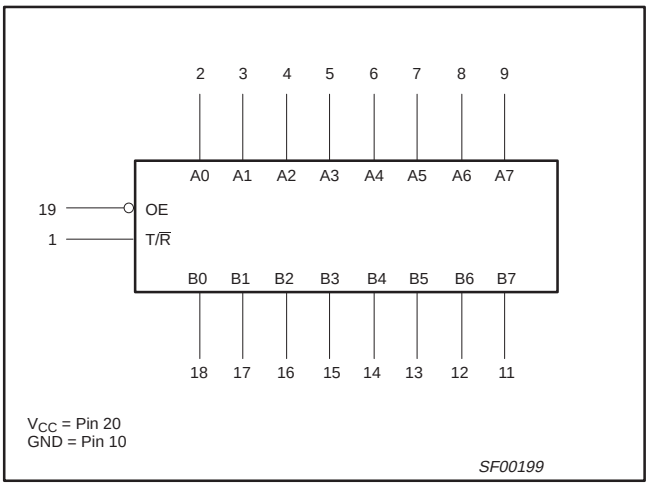
DESCRIPTION	COMMERCIAL RANGE V_{CC} = 5V ±10%, T_{amb} = 0°C to +70°C	DRAWING NUMBER
20-Pin Plastic DIP	N74F2245N	SOT146-1
20-Pin Plastic SOL	N74F2245D	SOT163-1
20-Pin Plastic SSOP	N74F2245DB	SOT339-1

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

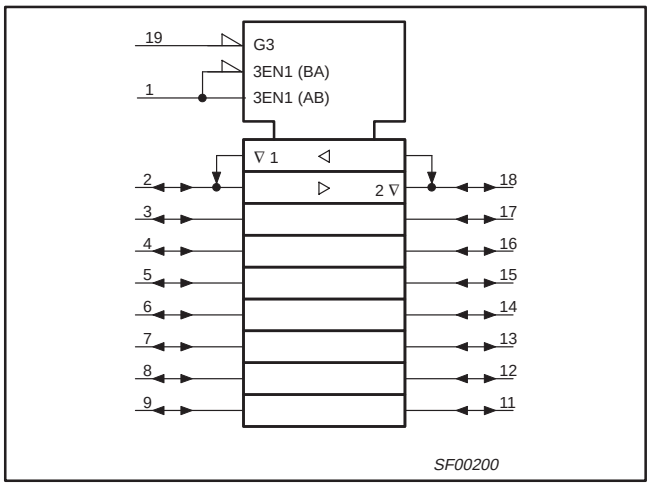
PINS	DESCRIPTION	74F (U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
A0-A7, B0-B7	Data inputs	3.5/1.0	70μA/0.6mA
$\overline{OE}$	Output Enable input (active Low)	1.0/2.0	20μA/1.2mA
T/$\overline{R}$	Transmit/Receive input	1.0/2.0	20μA/1.2mA
A0-A7	A port outputs	150/8	3.0mA/5mA*
B0-B7	B port outputs	150/8	3.0mA/5mA*

NOTE: One (1.0) FAST unit load is defined as: 20μA in the High state and 0.6mA in the Low state.
* 12mA with reduced noise margin

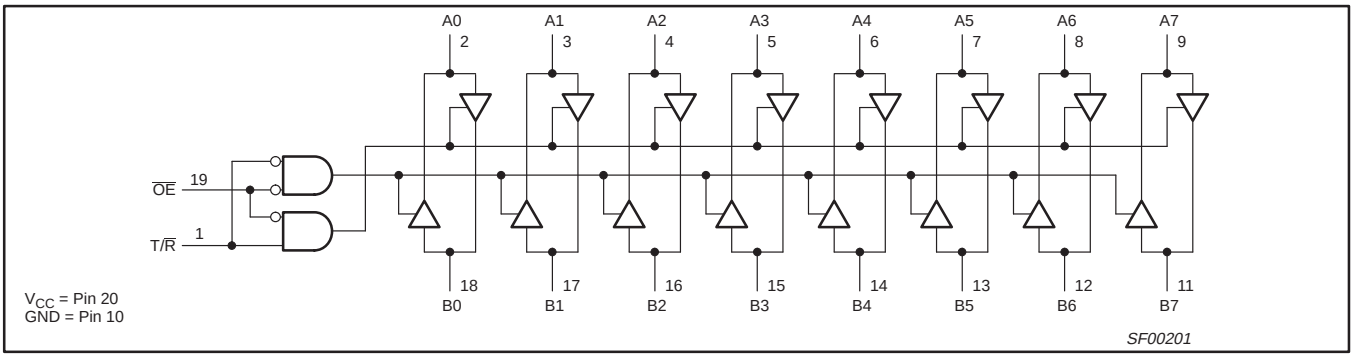
LOGIC SYMBOL



IEC/IEEE SYMBOL



LOGIC DIAGRAM



FUNCTION TABLE

INPUTS		OUTPUTS
$\overline{OE}$	T/$\overline{R}$	
L	L	Bus B data to Bus A
L	H	Bus A data to Bus B
H	X	Z

H = High voltage level
L = Low voltage level
X = Don't care
Z = High impedance "off" state

ABSOLUTE MAXIMUM RATINGS

(Operation beyond the limits set forth in this table may impair the useful life of the device.
Unless otherwise noted these limits are over the operating free-air temperature range.)

SYMBOL	PARAMETER		RATING	UNIT
V_{CC}	Supply voltage		–0.5 to +7.0	V
V_{IN}	Input voltage		–0.5 to +7.0	V
I_{IN}	Input current		–30 to +5	mA
V_{OUT}	Voltage applied to output in High output state		–0.5 to +5.5	V
I_{OUT}	Current applied to output in Low output state	A0-A7	24	mA
		B0-B7	24	mA
T_{amb}	Operating free-air temperature range		0 to +70	°C
T_{stg}	Storage temperature range		–65 to +150	°C

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER		LIMITS			UNIT
			MIN	NOM	MAX	
V_{CC}	Supply voltage		4.5	5.0	5.5	V
V_{IH}	High-level input voltage		2.0			V
V_{IL}	Low-level input voltage				0.8	V
I_{IK}	Input clamp current				–18	mA
I_{OH}	High-level output current	A0-A7			–3	mA
		B0-B7			–3*	mA
I_{OL}	Low-level output current	A0-A7			5*	mA
		B0-B7			5*	mA
T_{amb}	Operating free-air temperature range		0		+70	°C

* 12 mA with reduced noise margin

DC ELECTRICAL CHARACTERISTICS

(Over recommended operating free-air temperature range unless otherwise noted.)

SYMBOL	PARAMETER		TEST CONDITIONS[2]			LIMITS			UNIT
						MIN	TYP[1]	MAX	
V_{OH}	High-level output voltage	A0-A7, B0-B7	V_{CC} = MIN, V_{IL} = MAX, V_{IH} = MIN	I_{OH} = –3mA	±10% V_{CC}	2.4			V
					±5% V_{CC}	2.7	3.4		V
		A0-A7, B0-B7		I_{OH} = –12mA	±10% V_{CC}	2.0			V
					±5% V_{CC}	2.0			V
V_{OL}	Low-level output voltage	A0-A7, B0-B7	V_{CC} = MIN, V_{IL} = MAX, V_{IH} = MIN	I_{OL} = 5mA	±10% V_{CC}		0.42	0.50	V
				I_{OL} = 5mA	±5% V_{CC}		0.42	0.50	V
		A0-A7, B0-B7		I_{OL} = 12mA	±10% V_{CC}		0.55	0.67	V
					±5% V_{CC}		0.55	0.67	
V_{IK}	Input clamp voltage		V_{CC} = MIN, I_I = I_{IK}				–0.73	–1.2	V
I_I	Input current at maximum input voltage	$\overline{OE}$, T/$\overline{R}$	V_{CC} = 5.5V, V_I = 7.0V					100	µA
		A0-A7, B0-B7	V_{CC} = 5.5V, V_I = 5.5V					1	mA
I_{IH}	High-level input current	$\overline{OE}$, T/$\overline{R}$ only	V_{CC} = MAX, V_I = 2.7V					20	µA
I_{IL}	Low-level input current	$\overline{OE}$, T/$\overline{R}$ only	V_{CC} = MAX, V_I = 0.5V					–1.2	mA
I_{IH}+I_{OZH}	Off-state output current High level voltage applied		V_{CC} = MAX, V_O = 2.7V					70	µA
I_{IL}+I_{OZL}	Off-state output current Low level voltage applied		V_{CC} = MAX, V_O = 0.5V					–600	µA
I_{OS}	Short-circuit output current[3]	A0-A7	V_{CC} = MAX			–60		–150	mA
		B0-B7				–60		–150	mA
I_{CC}	Supply current (total)	I_{CCH}	V_{CC} = MAX				60	87	mA
		I_{CCL}					70	100	mA
		I_{CCZ}					75	110	mA

NOTES:

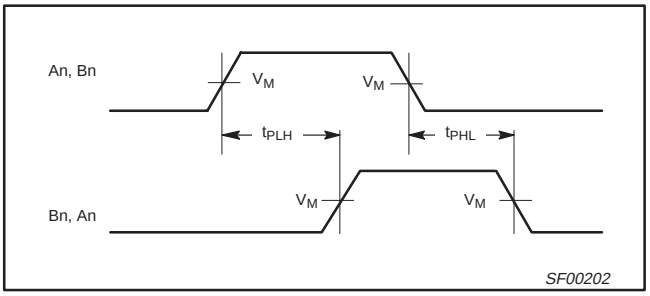
1 For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2 All typical values are at V_{CC} = 5V, T_{amb} = 25°C.
3 Not more than one output should be shorted at a time. For testing I_{OS}, the use of high-speed test apparatus and/or sample-and-hold techniques are preferable in order to minimize internal heating and more accurately reflect operational values. Otherwise, prolonged shorting of a High output may raise the chip temperature well above normal and thereby cause invalid readings in other parameter tests. In any sequence of parameter tests, I_{OS} tests should be performed last.

AC ELECTRICAL CHARACTERISTICS

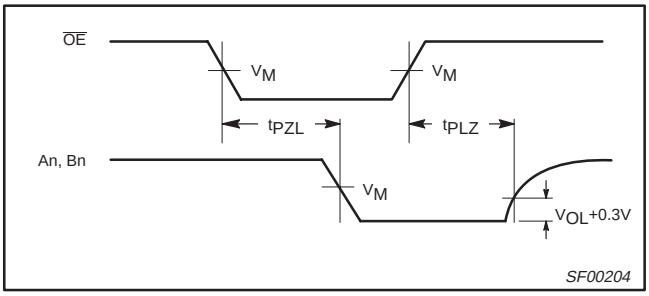
SYMBOL	PARAMETER	TEST CONDITION	LIMITS					UNIT
			V_{CC} = +5.0V T_{amb} = +25°C C_L = 50pF, R_L = 500Ω			V_{CC} = +5.0V ± 10% T_{amb} = 0°C to +70°C C_L = 50pF, R_L = 500Ω		
			MIN	TYP	MAX	MIN	MAX	
t_{PLH} t_{PHL}	Propagation delay An to Bn, Bn to An	Waveform 1	2.5 2.5	3.5 4.0	7.0 7.0	2.5 2.5	8.5 8.0	ns
t_{PZH} t_{PZL}	Output Enable time to High or Low level	Waveform 2 Waveform 3	2.5 3.5	4.5 5.5	8.0 8.5	2.0 3.5	9.5 9.5	ns
t_{PHZ} t_{PLZ}	Output Disable time from High or Low level	Waveform 2 Waveform 3	2.5 1.5	5.0 3.5	7.0 6.5	2.0 1.0	7.5 7.0	ns

AC WAVEFORMS

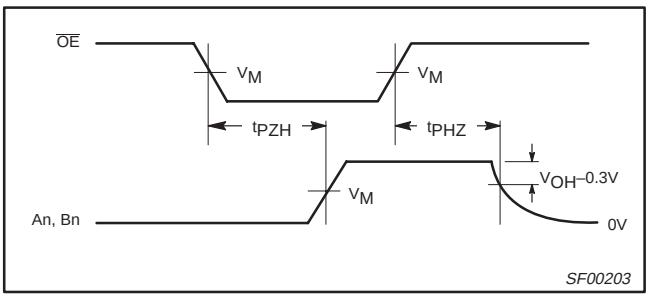
For all waveforms, V_M = 1.5V.



Waveform 1. Propagation Delay for Non-Inverting Output

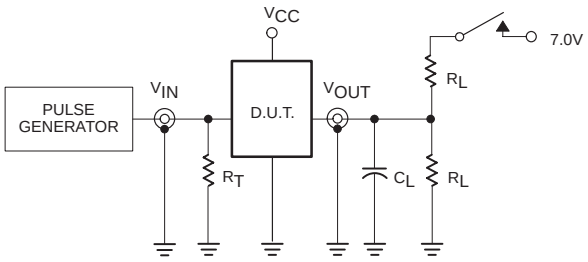


Waveform 3. 3-State Output Enable Time to Low Level and Output Disable Time from Low Level

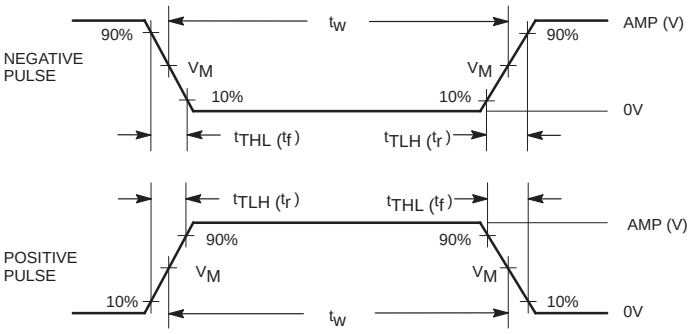


Waveform 2. 3-State Output Enable Time to High Level and Output Disable Time from High Level

TEST CIRCUIT AND WAVEFORMS



Test Circuit for Open Collector Outputs



Input Pulse Definition

SWITCH POSITION

TEST	SWITCH
t_{PLZ}	closed
t_{PZL}	closed
All other	open

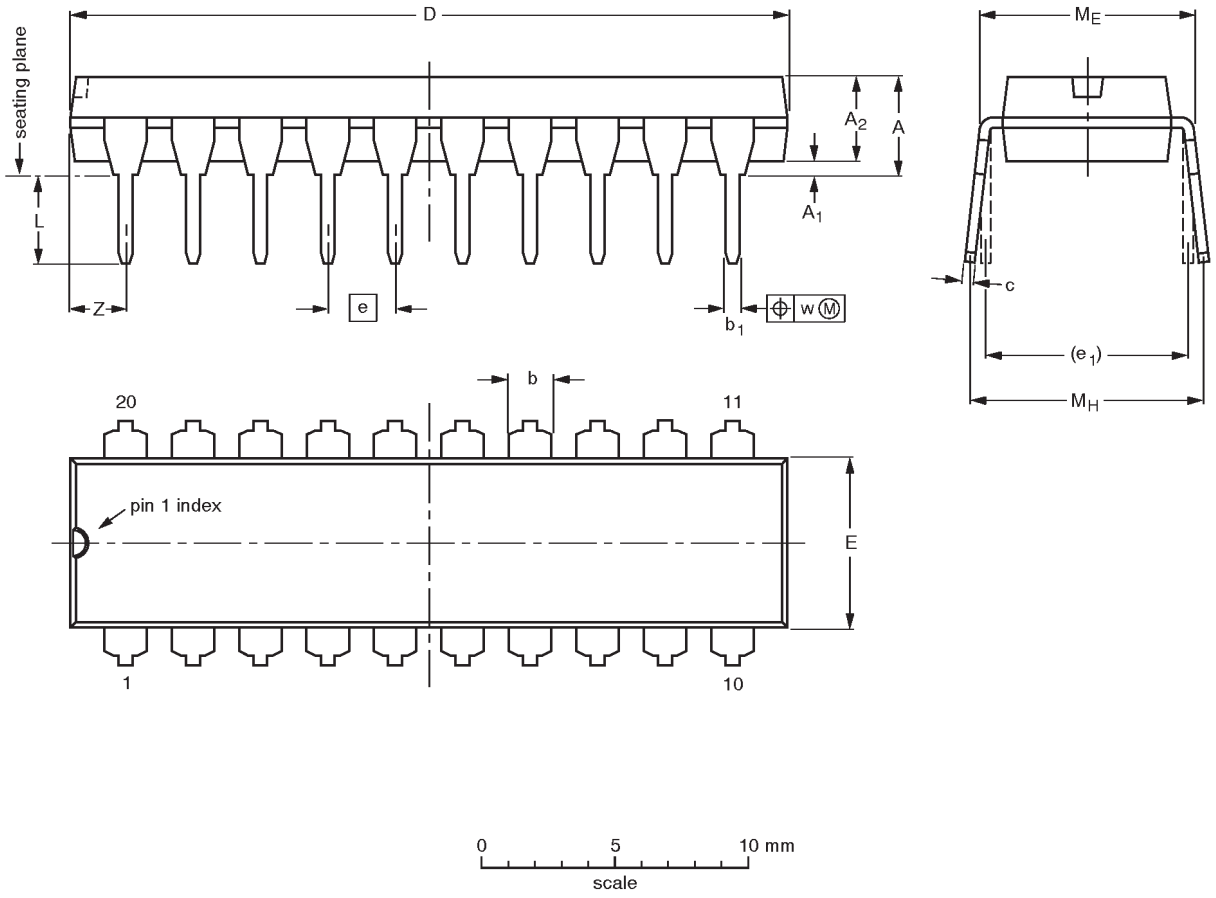
DEFINITIONS:

R_L = Load resistor; see AC electrical characteristics for value.
C_L = Load capacitance includes jig and probe capacitance; see AC electrical characteristics for value.
R_T = Termination resistance should be equal to Z_{OUT} of pulse generators.

family	INPUT PULSE REQUIREMENTS					
	amplitude	V_M	rep. rate	t_w	t_{TLH}	t_{THL}
74F	3.0V	1.5V	1MHz	500ns	2.5ns	2.5ns

SF00128

DIP20: plastic dual in-line package; 20 leads (300 mil) **SOT146-1**



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

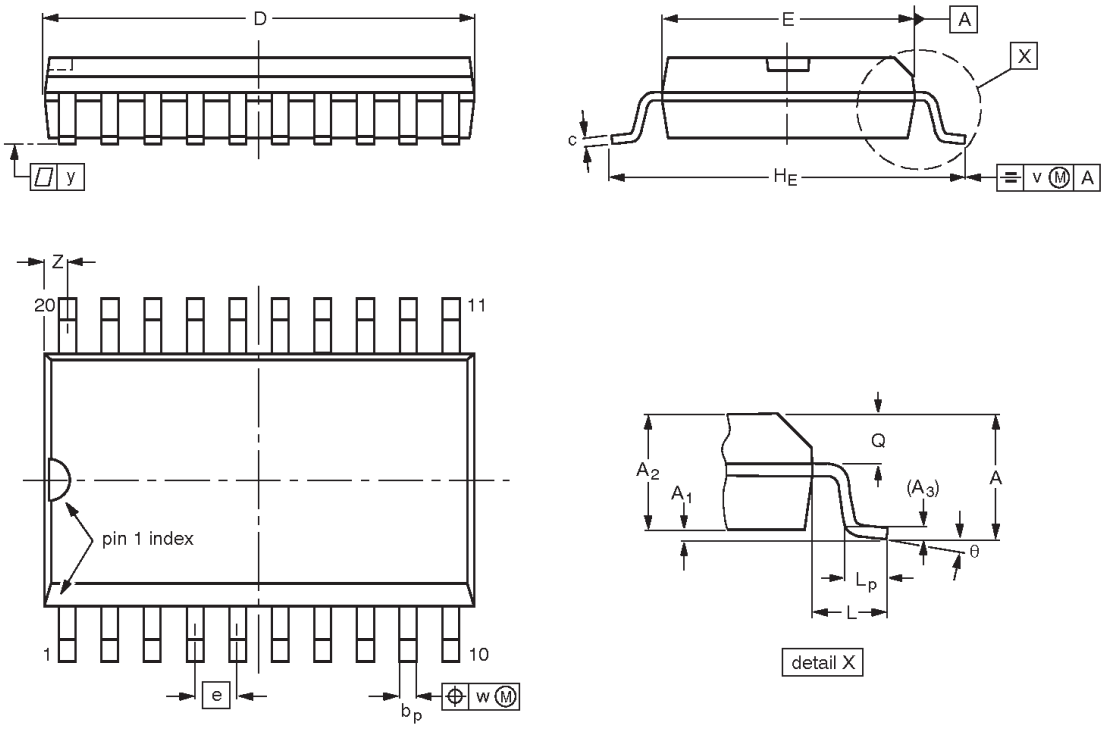
UNIT	A max.	A_1 min.	A_2 max.	b	b_1	c	D (1)	E (1)	e	e_1	L	M_E	M_H	w	Z (1) max.
mm	4.2	0.51	3.2	1.73 1.30	0.53 0.38	0.36 0.23	26.92 26.54	6.40 6.22	2.54	7.62	3.60 3.05	8.25 7.80	10.0 8.3	0.254	2.0
inches	0.17	0.020	0.13	0.068 0.051	0.021 0.015	0.014 0.009	1.060 1.045	0.25 0.24	0.10	0.30	0.14 0.12	0.32 0.31	0.39 0.33	0.01	0.078

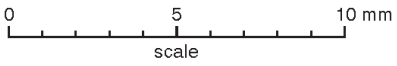
Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT146-1			SC603			~~92-11-17~~ 95-05-24

SO20: plastic small outline package; 20 leads; body width 7.5 mm **SOT163-1**





DIMENSIONS (inch dimensions are derived from the original mm dimensions)

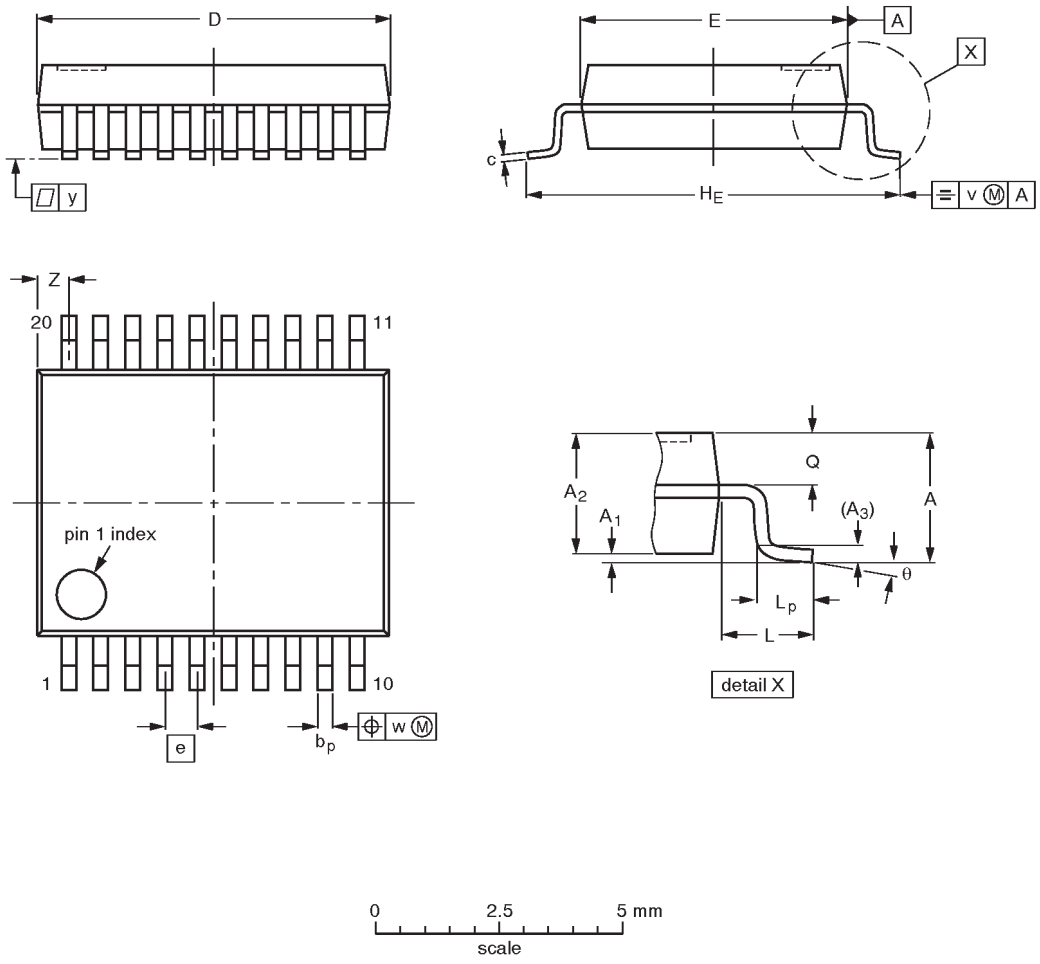
UNIT	A max.	A_1	A_2	A_3	b_p	c	D (1)	E (1)	e	H_E	L	L_p	Q	v	w	y	Z (1)	θ
mm	2.65	0.30 0.10	2.45 2.25	0.25	0.49 0.36	0.32 0.23	13.0 12.6	7.6 7.4	1.27	10.65 10.00	1.4	1.1 0.4	1.1 1.0	0.25	0.25	0.1	0.9 0.4	8° 0°
inches	0.10	0.012 0.004	0.096 0.089	0.01	0.019 0.014	0.013 0.009	0.51 0.49	0.30 0.29	0.050	0.42 0.39	0.055	0.043 0.016	0.043 0.039	0.01	0.01	0.004	0.035 0.016	

Note

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT163-1	075E04	MS-013AC				~~92-11-17~~ 95-01-24

SSOP20: plastic shrink small outline package; 20 leads; body width 5.3 mm **SOT339-1**



DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	2.0	0.21 0.05	1.80 1.65	0.25	0.38 0.25	0.20 0.09	7.4 7.0	5.4 5.2	0.65	7.9 7.6	1.25	1.03 0.63	0.9 0.7	0.2	0.13	0.1	0.9 0.5	8° 0°

Note

1. Plastic or metal protrusions of 0.20 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT339-1		MO-150AE				~~93-09-08~~ 95-02-04

DEFINITIONS

Data Sheet Identification	Product Status	Definition
Objective Specification	Formative or in Design	This data sheet contains the design target or goal specifications for product development. Specifications may change in any manner without notice.
Preliminary Specification	Preproduction Product	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product Specification	Full Production	This data sheet contains Final Specifications. Philips Semiconductors reserves the right to make changes at any time without notice, in order to improve design and supply the best possible product.

Philips Semiconductors and Philips Electronics North America Corporation reserve the right to make changes, without notice, in the products, including circuits, standard cells, and/or software, described or contained herein in order to improve design and/or performance. Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no license or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

LIFE SUPPORT APPLICATIONS
Philips Semiconductors and Philips Electronics North America Corporation Products are not designed for use in life support appliances, devices, or systems where malfunction of a Philips Semiconductors and Philips Electronics North America Corporation Product can reasonably be expected to result in a personal injury. Philips Semiconductors and Philips Electronics North America Corporation customers using or selling Philips Semiconductors and Philips Electronics North America Corporation Products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors and Philips Electronics North America Corporation for any damages resulting from such improper use or sale.

Philips Semiconductors
811 East Arques Avenue
P.O. Box 3409
Sunnyvale, California 94088–3409
Telephone 800-234-7381

Philips Semiconductors and Philips Electronics North America Corporation register eligible circuits under the Semiconductor Chip Protection Act.
© Copyright Philips Electronics North America Corporation 1996
All rights reserved. Printed in U.S.A.

(print code) Date of release: July 1994

Document order number: 9397-750-05199